Variation and the Timing and Distribution of Herring Spawn in the Strait of Georgia, British Columbia

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Abstract

Fisheries and Oceans Canada has collected data on the distribution, timing and abundance of herring spawning in the Strait of Georgia (SOG) since the early 1930s. Since record collections started, many changes in spawning have occurred. Until the mid-1960s catches in a reduction fishery often exceeded 60,000 tonnes. Spawning abundance increased in the 1970s after the reduction fishery was closed and replaced by a roe fishery, with smaller catches and precautionary management. Subsequently, spawn abundance and spawning stock biomass (SSB) reached historically high levels in the late 1990s. Concurrently, spawn distribution became concentrated in northern SOG, especially around Denman Island and the duration of spawning has contracted with fewer early spawns than previous decades. The causes of these changes are uncertain. Anthropogenic impacts, especially fisheries or coastal zone developments, might be implicated but we see temporal and spatial changes in spawning - both in areas with, and without such impacts. Significant environmental changes also are implicated, such as an increase in sea surface temperature (SST). We show a significant correlation between spawn distribution and timing and SST in SOG but such relationships are not convincing because they do not occur in others of the BC coast, subjected to similar SST change. Although the distribution and timing changes are unsettling, the SOG herring population appears to be in excellent condition, with a broadly distributed age structure, near-record high SSB, and good recruitment. The 1999 cohort, spawning as 3-year-old herring in 2002, was largest in 50 years and the second largest recorded.